WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002MI5B

Title: Grid Computing for Real Time Distributed Collaborative Geoprocessing - with Applications in Water Quality Management

Project Type: Research

Focus Categories: Water Quality, Non Point Pollution, Management and Planning

Keywords: Grid Computing, Virtual Organization (VO), Water Quality Modeling, Water Quality Management

Start Date: 03/01/2002

End Date: 02/28/2003

Federal Funds Requested: $15,000

Non-Federal Matching Funds Requested: $31,023

Congressional District: Eighth

Principal Investigator:
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Abstract

Grid computing has emerged as an important new field in the distributed computing arena. It focuses on large-scale resource sharing, innovative applications, and, in some cases, high-performance orientation within a so-called Virtual Organization (VO). It has great capability to link multiple agencies with a network of shared data, software, and processors. The degree of integration that a VO employing Grid computing technologies can achieve is unprecedented. We maintain that grid technologies show great promise for enhancing a variety of geospatial applications, particularly those with intensive computing requirements and a multi-organizational structure.

To test this hypothesis, we will be conducting experiments on a water quality management VO testbed. Water quality management is a holistic activity that involves coordination among different organizations and collective decision-making based upon information from different sources. The ultimate goal is to model agricultural non-point source water contamination as part of an effort to improve water quality and support land use planning and agricultural production on a sustained basis. There is also an urgent need to educate the general public on watershed problems and to develop and implement agendas to meet these problems. Our experiments will be directed to the challenging task of distributing data and processing for a real time water quality model across multiple nodes distributed across the Internet. The findings could include significant implications for water quality management, hydrologic modeling, distributed geographic information systems, and organizational decision making.